Summary of Charbert Hydrogen Sulfide Data – July 16 - July 26, 2004

The Rhode Island Department of Environmental Management (RI DEM) is currently monitoring continuously for hydrogen sulfide on 16 River Street in Alton, the neighborhood nearest to the lagoons at the Charbert facility. The monitor at that location ran continuously during the period of July 16 through July 26, 2004 and recorded elevated concentrations of hydrogen sulfide on seven of the ten nights during that period. Specifically:

- Hydrogen sulfide levels were frequently above 10 ppb from 10:50 PM on Friday, July 16th to 8:00 AM on Saturday, July 17th. Wind conditions were calm throughout that period. The highest reading during that period, recorded at 4:37 AM on the 17th, was 90 ppb and the highest one-hour average concentration was 52 ppb. Since 90 ppb is the highest level that can be measured by the monitor in its current configuration, the level during the fifteen-minute period when that concentration was measured may actually have been higher than 90 ppb.

- Hydrogen sulfide levels were elevated for most of the period from 10:40 PM on Saturday, July 17th to 6:00 AM on Sunday, July 18th. Wind conditions were calm during that period. The highest reading, recorded at 1:52 AM, was 37 ppb and the highest one-hour average was 28 ppb.

- Hydrogen sulfide levels were intermittently elevated up to a high of 17 ppb between 10:00 PM on Monday, July 19th and 4:15 AM on Tuesday, July 20th. Concentrations were again elevated from 5:52 to 7:20 AM on the 20th. The highest reading recorded during that period was 52 ppb, recorded at 6:22 AM, and the highest one-hour average concentration was 43 ppb. Winds were from the south during that period.

- Hydrogen sulfide concentrations were elevated continuously from 1:17 – 7:45 AM on Wednesday, July 21st. The wind conditions were calm throughout this period. The monitor recorded a concentration of 89 ppb for the 15-minute period beginning at 6:18 AM and concentrations at or above 90 ppb for the next 30-minute period (6:33 – 7:02 AM). The highest one-hour average was at least 86 ppb, and may have been higher if the 15-minute concentrations exceeded 90 ppb, the maximum concentration that could be recorded by the monitor. This is the first time that concentrations have remained at or above 90 ppb for two consecutive 15-minute sampling intervals.

- Hydrogen sulfide levels were elevated from 9:47 PM on Wednesday, July 21st to 8:21 AM on Thursday, July 22nd. The highest concentration during that period was

72 ppb at 6:38 AM on the 22nd and the highest one-hour average concentration was 56 ppb. Wind conditions were calm throughout this period.

- Concentrations were above 10 ppb intermittently between 8:43 PM on Thursday, July 22nd and 10:06 AM on Friday, July 23rd. The highest concentration during that period, 48 ppb, was recorded at 7:18 AM on the 23rd and the highest one-hour concentration was 26 ppb. Winds were south to southwest during this period.

- Elevated concentrations were observed frequently between 7:57 PM on Friday, July 23rd and 5:11 AM on Saturday, July 24th. The highest concentration, 32 ppb, occurred at 3:43 AM on the 24th and the highest one-hour concentration was 23 ppb. Winds were south to south-southwest during that period.

- During the three nights that hydrogen sulfide concentrations were not elevated, July 18th –19th, 24th – 25th and 25th – 26th, the wind was blowing from the north, away from the lagoons. There was a light rain on two of those nights.

In summary, elevated hydrogen sulfide levels occurred at the River Street location during the late night to early morning hours on seven of the ten nights between July 16th and July 26th. Stagnant wind conditions or southerly winds were present when the levels were elevated. On the nights that the concentrations were not elevated, the wind was blowing from a northerly direction, away from the lagoons.

Concentrations at or above 90 ppb, the upper end of the range of the hydrogen sulfide concentrations that can be measured with the instrumentation in its current configuration, were recorded on two days, during the early morning hours. 90 ppb concentrations were recorded for a 15-minute period beginning at 4:37 AM on July 17th and for a thirty minute period beginning at 6:33 AM on July 21st. Concentrations of 90 ppb have also been recorded twice in previous weeks, the 15-minute periods beginning at 4:29 AM on June 24th and at 6:55 AM on July 4th. In order to record higher concentrations, RI DEM has installed a second monitor adjacent to the first monitor that is configured to measure levels of 60 - 1400 ppb. This monitor has been operational since Tuesday, July 27th.

Table A shows the maximum 15-minute, one-hour and 24-hour average hydrogen sulfide concentrations measured by the River Street monitor during the most recent and previous monitoring periods and the concentrations measured previously at a site on Woodville-Alton Road that has since been discontinued.

Table A Maximum Hydrogen Sulfide Levels

Monitor	Date	Maximum 15-minute Level	Maximum 1-hour Level Nuisance Air Quality >2 - <100 ppb Moderate Air Quality 100 - <1000 ppb	Maximum 24-hour Level Nuisance Air Quality >2 - < 30 ppb Moderate Air Quality 30 - <70 ppb
River Street	6/7– 6/14/04	78 ppb	49 ppb	7 ppb
	6/15 – 6/21/04	44 ppb	29 ppb	7 ppb
	6/21 – 6/28/04	90 ppb*	79 ppb*	15 ppb
	6/28 – 7/7/04	90 ppb*	78 ppb*	16 ppb
	7/7 – 7/12/04	45 ppb	33 ppb	7 ppb
	7/16 – 7/26/04	90 ppb*	86 ppb*	16 ppb
Woodville-Alton Rd	5/13 – 6/7/04	6 ppb	2 ppb	0.2 ppb
	6/6 – 6/14/04	27 ppb	19 ppb	3 ppb
	6/15 – 6/21/04	10 ppb	5 ppb	1 ppb
	6/22 – 6/28/04	16 ppb	13 ppb	2 ppb
	6/28 – 7/7/04	39 ppb	28 ppb	2 ppb
	7/7 – 7/15/04	12 ppb	7 ppb	1 ppb

*Due to the limitations of the instrumentation, concentrations during these periods may have been higher than these values.

The elevated levels recorded by the River Street monitor during the July 16 - 26 period continue to be in the range of values that are classified as nuisance levels by the Rhode Island Department of Health (HEALTH). These levels would clearly be associated with a noticeable rotten-egg type odor. HEALTH warns that people exposed to nuisance levels of hydrogen sulfide may experience nausea and stress from the odors, an increase in non-specific symptoms and a possible exacerbation of chronic respiratory symptoms in hypersensitive individuals.

The one-hour average concentration recorded during the period beginning at 6:13 AM on July 21st was 86 ppb. However, the concentrations were at the maximum range of the instrumentation, 90 ppb, for 30 minutes during that period and may have actually been higher. If the concentration during those 30 minutes was 118 ppb or higher, the one-hour average concentration would reach HEALTH's range for moderate air quality (100 - <1,000 ppb as a one-hour average). HEALTH warns that exposures in that range are associated with nuisance effects, irritation in the general population and the risk of the exacerbation of chronic respiratory disease symptoms. With the installation of the second monitor discussed above, RI DEM will now be able to accurately measure levels at or above 90 ppb.

Hydrogen sulfide monitoring is continuing at the River Street location. For more information about sampling results, contact Barbara Morin at 222-4700, ext. 7012.